Be sure. testo

Keep a watchful eye on all environmental parameters.

Thermohygrometers, data loggers and monitoring systems for standard-compliant environmental monitoring in the pharmaceutical sector.

You know exactly what you need: We have the perfect solution.

Temperature-sensitive products require special production and storage conditions. These are defined by corresponding regulatory and legal requirements, and compliance with them is mandatory.

But which measuring solution is ideal for measuring and documenting parameters such as temperature, humidity, pressure and CO_2? Testo's portfolio includes three technologies which have established themselves on the market:

Thermohygrometers	Stand-alone data loggers	Monitoring systems
• Measure the current temperature and humidity value. • Customizable measurement intervals. • Measurement data memory for up to 90 days. • Display of min. and max. values. • Visual alarms when limit values are exceeded.	• Measure and document temperature and humidity curves automatically. • Manual readout of measuring values. • Visual alarms. • Store up to 16,000 readings with a battery life of approx. 1 year.	• Measure, monitor and document temperature and humidity, seamlessly and completely automatically. • Comprehensive alarm options in the event of limit value violations. • Very secure storage of readings. • Measurement data can be accessed at any time, from anywhere and with any terminal device.
Complexity of installation: ▶ Very easy	**Complexity of installation:** ▶ Easy	**Complexity of installation:** ▶ High

But which solution best suits your requirements? As a matter of principle, the following applies: The more measuring points to be monitored and the more stringent the regulatory requirements for safety, the higher the degree of automation you should be looking for. This also results in clear time and cost savings.

Moreover, the following questions will help you find the optimal measuring technology to suit your requirements:

How many measuring points do you wish to monitor?

When it comes to using the measuring technology, what level of convenience do you require?

How stringent are your requirements for secure and uninterrupted documentation?

How complex and strict are the legal regulations you have to comply with?

How important is it for you to have extensive alarm options?

Thermohygrometers, data loggers and monitoring systems:

A comparison of their features and functions.

Thermohygrometers	Stand-alone data loggers	Fully automated monitoring systems
Measure individual values and display the actual state as well as min. and max. values.	Measure and store development curves for later evaluation.	Monitor readings in real time and enable data access from anywhere.
• **Measurement data recording:** For up to 90 days. • **Data storage:** Temporarily in the measuring instrument. • **Readout and analysis of the measurement data:** Manual. • **Alarms in the event of limit value violations and critical system events:** LED display on the measuring instrument.	• **Measurement data recording:** Automated and continuous without any manual readout of the temperature curve. • **Data storage:** In the data logger. • **Readout and analysis of the measurement data:** Manual. • **Alarms in the event of limit value violations:** LED display on the data logger.	• **Measurement data recording:** Automated and continuous without any manual readout of the temperature curve. • **Data storage:** Ultimate data security thanks to redundant storage of recorded readings at different instances within the system. • **Readout and analysis of the measurement data:** Automated archiving of the measurement data. The documentation can be called up from anywhere and at any time. Reports can be sent automatically. • **Alarms in the event of limit value violations and critical system events:** SMS, e-mail or LED display on hardware.
▶ Thermohygrometer testo 608-H1 ▶ Thermohygrometer testo 608-H2 ▶ Thermohygrometer testo 622 ▶ Thermohygrometer testo 623	▶ Mini data logger series testo 174 ▶ Data logger series testo 175 ▶ Data logger series testo 176	▶ Radio data logger system testo Saveris 2 ▶ Environmental monitoring system testo Saveris 1

A brief outline:

Thermohygrometers, data loggers and monitoring systems from Testo.

Product range	Thermohygrometer	testo 174	testo 175
			
Fields of application	• Measuring temperature and humidity in commercial premises, offices, warehouses and laboratories	• Monitoring warehouse goods that are sensitive to temperature and humidity • Monitoring the IAQ in buildings • Transport monitoring	• Long-term monitoring of cold storage and freezer facilities • Documenting the transport temperature in trucks • Monitoring temperature and relative humidity in work and storage areas
Programming and analysis	• No programming possible • Manual analysis with manual reading and documentation of measured values	• With the free software testo ComSoft Basic, among others	• With the free software testo ComSoft Basic, among others
Advantages	• Cost-effective • Minimal installation and maintenance required	• Cost-effective • Compact format • Long-term stability of readings	• 2 connections for external probes • Wide measuring range • Stores up to 1 million readings
Details	Pages 8 – 11	Pages 12 – 13	Pages 14 – 17

Product range	testo 176	testo Saveris 2	testo Saveris 1
			
Fields of application	• Long-term measurements even in extreme conditions • Monitoring the temperature of cold storage facilities and warehouses • Monitoring laboratory conditions	• Automated monitoring of temperature, humidity and CO_2 concentrations in storage and work areas	• Fully automatic and uninterrupted monitoring of temperature, humidity and differential pressure through the integration of transmitters
Programming and analysis	• With the free software testo ComSoft Basic, among others	• Via the intuitive web-based cockpit	• testo Saveris PRO software • testo Saveris CFR software (validatable, including ERES & audit trail) • Web-based cockpit for access at any time and from any device
Advantages	• Extremely robust • Stores up to 2 million readings • Up to 8 years of battery life	• Fully automated • Alerts via SMS or e-mail • Data access independent of location	• Triple data storage • Highly scalable • 21 CFR Part 11-compliant • Alerts via SMS and e-mail
Details	Pages 18 – 23	Pages 24 – 27	Pages 28 – 34

Be sure. testo

If you want to be absolutely sure:

Compare the technical data.

	testo 608 H1	testo 608 H2	testo 622	testo 623	testo 174 T	testo 174 H	testo 175 T1	testo 175 T2	testo 175 T3	testo 175 H1	testo 176 T2	testo 176 T4	testo 176 H1	testo 176 P1	testo 176 T1	testo 176 T3	testo 176 H2	testo Saveris 2 T1	testo Saveris 2 T2	testo Saveris 2 T3	testo Saveris 2 H1	testo Saveris 2 H2	testo 160 IAQ	testo 150 TUC4	testo 150 TC4	testo 150 DIN2	testo 150 T1
Measurement parameter																											
Temperature	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Humidity	✓	✓	✓	✓	–	✓	–	–	–	✓	–	–	✓	✓	–	–	✓	–	–	–	✓	✓	✓	✓	–	–	–
Pressure	–	–	–	✓	–	–	–	–	–	–	–	–	–	✓	–	–	–	–	–	–	–	–	✓	✓*	–	–	–
CO_2	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓*	–	–	–
Applications																											
Monitoring transport conditions	–	–	–	–	✓	✓	✓	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
Warehouse monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Refrigerator monitoring	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓
Freezer monitoring	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	✓	✓	✓	✓
Cryogenic monitoring	–	–	–	–	–	–	–	–	–	–	✓	✓	–	–	–	–	–	–	–	✓	–	–	–	✓	✓	✓	–
IAQ (Indoor Air Quality) monitoring	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Monitoring extreme conditions	–	–	–	–	–	–	–	–	✓	–	✓	✓	–	–	–	✓	–	–	–	✓	–	–	–	✓	✓	✓	–
Characteristics																											
Items shown																											
Display	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Alerts																											
Alerts on the measuring instrument	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	✓	✓	✓	✓	✓
More alerting functions (SMS, mail etc.)	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Data transmission																											
USB	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
WLAN	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Connectivity	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓**	✓**	✓**	✓**
Ethernet	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓
Data storage																											
Manual	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	–	–	–	–
Cloud-based	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	–	–	–	–
On-premises	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	✓	✓	✓	✓
Sensors & channels																											
Total number of channels	2	2	3	2	1	2	1	2	2	2	2	4	4	5	1	4	4	1	2	2	2	2	4	16	4	2	1
Number of connections for external probes	–	–	–	–	–	–	–	1	2	–	2	4	–	2	–	4	2	–	2	2	–	1	0	4	4	2	0
Sensor type (temperature)	NTC	NTC	NTC	NTC	NTC	NTC	NTC	NTC	TC type K / TC type T	NTC	Pt 100	TC type K / TC type T / TC type J	NTC	NTC	Pt 100	TC type K / TC type T / TC type J	NTC	NTC	NTC	TC type K / TC type T / TC type J	NTC	NTC	NTC	Pt100 / NTC	TC type K / TC type T / TC type J	Pt100 / NTC	NTC
Certifications/compliance																											
HACCP-compliant	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–
21 CFR Part 11-compliant	–	–	–	–	–	–	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	–	–	–	–	–	–	✓	✓	✓	✓
Certified according to EN 12830	–	–	–	–	✓	✓	–	✓	✓	–	✓	✓	–	–	✓	–	–	✓	✓	–	–	–	–	✓	✓	✓	✓

* Differential pressure and CO_2 possible by integrating transmitters via the digital analog coupler.

** via testo UltraRange

The streamlined solution for temperature and humidity: Thermohygrometers from Testo.

°C

%RH

mBar

CO_2

Thermohygrometers are an inexpensive and uncomplicated method of monitoring temperature and humidity. You can use them to measure temperature and humidity, without having to put much effort or expense into their installation or maintenance. Only the current ambient value of the relevant measurement parameters is calculated and shown on a large display.

Measuring intervals of a thermohygrometer can be customized and, depending on the model, the instrument stores the measuring data of a time period of up to 90 days. The thermohygrometers also display the measured min. and max. values and come with a visual alarm in the event of limit value violations.

Suitable for monitoring the following areas:

- Offices
- Commercial premises
- Storage facilities
- Laboratories

The streamlined solution for temperature and humidity: Thermohygrometers from Testo.

	testo 608 H1	testo 608 H2	testo 622	testo 623
General information				
Brief description	Thermohygrometer with display for measuring temperature and humidity in the ambient surroundings	Thermohygrometer with display for measuring temperature and humidity in the ambient surroundings - with alarm function via LED display	Thermohygrometer with display for measuring temperature, humidity and pressure in the ambient surroundings	Thermohygrometer with display for measuring temperature and humidity in the ambient surroundings - with history function over the last 90 days
Technical data				
Measurement parameter	Temperature, humidity	Temperature, humidity	Temperature, humidity, pressure	Temperature/humidity
Measuring range	Temperature: 0 to +50 °C -20 to +50 °Ctd Humidity: +10 to 95 %RH	Temperature: -10 to +70 °C -40 to +70 °Ctd Humidity: +2 to +98 %RH	Temperature: -10 to +60 °C Humidity: 0 to 100 %RH* Pressure: 300 to 1200 hPa	Temperature: -10 to +60 °C Humidity: 0 to 100 %RH*
Accuracy	Temperature: ±0.5 °C (at +25 °C) Humidity: ±3 %RH* (+10 to +95 %RH)	Temperature: ±0.5 °C (at +25 °C) Humidity: ±2 %RH* (+2 to +98 %RH)	Temperature: ±0.4°C Humidity: ±2 %RH** at +25 °C (10 to 90 %RH) ±3 %RH** (remaining meas. range) Pressure: ±3 hPa	Temperature: ±0.4°C Humidity: ±2 %RH** at +25 °C (10 to 90 %RH) ±3 %RH** (remaining meas. range)
Solution	Temperature: 0.1 °C Humidity: 0.1 %RH	Temperature: 0.1 °C Humidity: 0.1 %RH	Temperature: 0.1 °C Humidity: 0.1 %RH Pressure: 0.1 hPa	Temperature: 0.1 °C Humidity: 0.1 %RH
Total channels	-	-	-	-
Number of external connections	-	-	-	-
Sensor type (temperature)	NTC	NTC	NTC	NTC
Measuring cycle	18 sec	18 sec	10 sec	20 sec
Transmission interval / communication cycle	-	-	-	-
Memory capacity	-	-	-	-
Interface	-	-	-	-
Operating/storage temperature	0 to +50 °C / -40 to +70 °C	0 to +50 °C / -40 to +70 °C	-10 to +60 °C / -20 to +60 °C	-10 to +60 °C / -20 to +60 °C
Battery type	9V monobloc battery	9V monobloc battery	-	-
Battery life	Approx. 1 year	Approx. 1 year	Approx. 1 year	Approx. 1 year
Dimensions / weight	111 x 90 x 40 mm / 168 g	111 x 90 x 40 mm / 168 g	185 x 105 x 36 mm / 240 g (without batteries)	185 x 105 x 36 mm / 240 g (without batteries)
Protection class	-	-	-	-
Software compatibility	-	-	-	-
Order number	**0560 6081**	**0560 6082**	**0560 6220**	**0560 6230**

Ready for use in transport and storage:
The testo 174 mini data logger series.

°C

%RH

mBar

CO_2

The testo 174 mini data loggers are ideal for monitoring warehouse goods that are sensitive to temperature and humidity. In addition to monitoring the IAQ in buildings, the testo 174 mini data loggers are also an ideal travel companion - simply enclosed with the goods, e.g. in containers and cold storage facilities, they monitor the temperature continuously, safely and inconspicuously.

The free ComSoft Basic software allows fast programming of the data logger as well as easy data analysis.
The cost-effective mini data loggers ensure reliable measurement results based on state-of-the-art measuring technology. The integrated sensors guarantee readings with long-term stability. This enables quality assurance guidelines to be complied with and documented securely.

Suitable for monitoring the following areas and equipment:

- Cold storage and freezer facilities
- Storage facilities
- Air conditioning in buildings
- Transport

Data

A comparison of testo 174 data loggers	 testo 174 T	 testo 174 H
General information		
Brief description	Mini data logger with USB port and internal NTC sensor for monitoring temperature in warehouses and during transport	Mini data logger with USB port and internal sensor for monitoring temperature and humidity in buildings and during transport
Technical data		
Measurement parameter	Temperature	Temperature/humidity
Measuring range	-30 to +70 °C	-20 to +70 °C / 0 to 100 %RH
Accuracy	±0.5 °C (-30 to +70 °C)	±0.5 °C (-20 to +70 °C) ±3 %RH (2 %RH to 98 %RH) at +25 °C ±0.03 %RH/K ±1 digit
Solution	0.1 °C	0.1 °C/0.1 %RH
Total channels	1	2
Number of external connections	None	None
Connection type	None	None
Sensor type (temperature)	NTC	NTC
Measuring cycle	1 min to 24 h	1 min to 24 h
Transmission interval / communication cycle	-	-
Memory capacity	16,000 readings	16,000 readings
Interface	USB	USB
Operating/storage temperature	-30 to +70 °C / -40 to +70 °C	-20 to +70 °C / -40 to +70 °C
Battery type	2 x 3V button cell (CR 2032)	2 x 3V button cell (CR 2032)
Battery life	500 days (15 min measuring cycle, +25 °C)	1 year (15 min measuring cycle, +25 °C)
Dimensions / weight	60 x 38 x 18.5 mm / 35 g	60 x 38 x 18.5 mm / 35 g
Protection class	IP 65	IP 20
Software compatibility	ComSoft Basic ComSoft Pro ComSoft CFR (Validatable, audit trail; ERES)	ComSoft Basic ComSoft Pro ComSoft CFR (Validatable, audit trail; ERES)
Order number	0572 1560	0572 6560

Keep a watchful eye on all environmental parameters.

Specialized in storage facility monitoring: testo 175 series.

°C

%RH

mBar

CO_2

The compact data loggers in the testo 175 series are suitable for long-term monitoring of cold storage and freezer facilities and for documenting the transport temperature in trucks. The testo 175 T2 version also has a connection for an external NTC temperature probe, for example to measure the core temperature of goods. For applications where the temperature has to be monitored in two places at the same time, the testo 175 T3 is ideal with its two connections for external thermocouples. The resulting large measuring range makes the data logger universally applicable.
The long-term stability of its humidity sensor makes the testo 175 H1 the professional compact data logger for monitoring temperature and relative humidity in work and storage areas. The external humidity probe (stub) features a faster response time compared to probes built into the housing.
The free ComSoft Basic software allows fast programming of the testo 175 data loggers as well as simple data analysis.

Suitable for monitoring the following areas and equipment:

- Cold storage and freezer facilities
- Air conditioning in buildings
- Storage facilities
- Transport
- Process temperatures

Specialized in storage facility monitoring:
testo 175 series.

EN 12830

testo 175 T1

EN 12830

testo 175 T2

EN 12830

testo 175 T3

EN 12830

testo 175 H1

General information

Brief description	Data logger with display and internal NTC sensor for monitoring temperature in cold storage and freezer facilities, storage facilities or during transport	Data logger with display and internal NTC sensor for monitoring temperature in cold storage and freezer facilities, storage facilities or during transport as well as a connection for an external probe (e.g. for measuring the core temperature of goods)	Data logger with display and 2 connections for external TC probes for monitoring extreme temperatures (e.g. monitoring process temperatures)	Data logger with display and external NTC sensor for monitoring temperature and humidity in storage facilities as well as the IAQ in buildings

Technical data

Measurement parameter	Temperature	Temperature	Temperature	Temperature/humidity
Measuring range	-35 to +55 °C	-35 to +55 °C int. / -40 to +120 °C ext.	-50 to +400 °C (Type T) -50 to +1000 °C (Type K)	-20 to +55 °C / 0 to 100 %RH
Accuracy	±0.4 °C (-35 to +55 °C)*	±0.5 °C (-35 to +55 °C)* ±0.3 °C (-40 to +120 °C)*	±0.5 °C (-50 to +70 °C)*±0.7% of measured value (+70.1 to +1000 °C)* (Type K)±0.5 °C (-50 to +70 °C)*±0.7% of measured value (70.1 to +400 °C)* (Type T)	±0.4 °C (-20 to +55 °C)* ±2 %RH (2 to 98 %RH) at +25 °C±0.03 %RH/K*
Solution	0.1 °C	0.1 °C	0.1 °C	0.1 °C/0.1 %RH
Total channels	1	2	2	2
Number of external connections	None	1	2	None
Sensor type (temperature)	NTC	NTC	TC type K / TC type T	NTC
Measuring cycle	10 sec to 24 h	10 sec to 24 h	10 sec to 24 h	10 sec to 24 h
Transmission interval / communication cycle	-	-	-	-
Memory capacity	1 million measuring values	1 million measuring values	1 million measuring values	1 million measuring values
Interface	Mini USB, SD card slot	Mini USB, SD card slot	Mini USB, SD card slot	Mini USB, SD card slot
Operating/storage temperature	-35 to +55 °C	-35 to +55 °C	-20 to +55 °C	-20 to +55 °C
Battery type	3 x AlMn Type AAA or Energizer	3 x AlMn Type AAA or Energizer	3 x AlMn Type AAA or Energizer	3 x AlMn Type AAA or Energizer
Battery life	3 years (15 min measuring cycle, +25 °C)	3 years (15 min measuring cycle, +25 °C)	3 years (15 min measuring cycle, +25 °C)	3 years (15 min measuring cycle, +25 °C)
Dimensions / weight	89 x 53 x 27 mm / 130 g	89 x 53 x 27 mm / 130 g	89 x 53 x 27 mm / 130 g	89 x 53 x 27 mm / 130 g
Protection class	IP 65	IP 65	IP 65	IP 54
Software compatibility	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)
Order number	0572 1751	0572 1752	0572 1753	0572 1754

Keep a watchful eye on all environmental parameters.

Extra-high-precision for monitoring during production: testo 176 series.

°C

%RH

mBar

CO_2

Thanks to their reliability, the data loggers in the testo 176 series are suitable for use over long periods of time. Whether you're looking for an instrument to monitor the temperature of cold storage facilities or warehouses, or to monitor laboratory conditions - this data logger series has a suitable model for every application. Depending on the application, you can choose between instruments that feature durability or clarity.
The models with an integrated, robust metal housing are ideal for applications in extreme conditions. For greater clarity, opt for the data logger variants with a large, easy-to-read display.

Suitable for monitoring the following areas and equipment:

- Cold storage and freezer facilities
- Air conditioning in buildings
- Storage facilities
- Transport
- Laboratories
- Cryogenic applications
- Process temperatures

Extra-high-precision for monitoring during production: testo 176 series.

A comparison of testo 176 data loggers	 testo 176 T2	 testo 176 T4	 testo 176 H1	 testo 176 P1
General information				
Brief description	Data logger with display and 2 connections for external Pt100 probes for high-precision temperature monitoring in cold storage and freezer facilities, storage facilities and during transport	Data logger with display and 4 connections for external TC probes for monitoring extreme temperatures such as cryogenic applications or for monitoring process temperatures	Data logger with display and 2 connections for external temperature and humidity probes for monitoring the IAQ in buildings (particularly with regard to mould growth) and for monitoring temperature and humidity in storage facilities	Data logger with display and 2 connections for external temperature and humidity probes for monitoring laboratory conditions as well as an internal sensor for monitoring absolute pressure
Technical data				
Measurement parameter	Temperature	Temperature	Temperature/humidity	Temperature/humidity/absolute pressure
Measuring range	-100 to +400 °C	-100 to +750 °C (Type J)- 195 to +1000 °C (Type K) -200 to +400 °C (Type T)	-20 to +70 °C / 0 to 100 %RH	-20 to +70 °C 0 to 100 %RH 600 to 1100 mbar
Accuracy	±0.2 °C (-100 to +200 °C)* ±0.3 °C (+200.1 to +400 °C)*	±1 % of m.v (-200 to -100.1 °C)* ±0.3 °C (-100 to +70 °C)* ±0.5 % of m.v (+70.1 to +1000 °C)*	±0.2 °C (-20 to +70 °C)* ±0.4 °C* (remaining meas. range) / probe-specific	±0.2 °C (-20 to +70 °C)* ±0.4 °C* (remaining meas. range) / probe-specific ±3 mbar (0 to +50 °C)*
Solution	0.01 °C	0.1 °C	0.1 °C / 0.1 %RH	0.1 °C / 0.1 %RH / 1 mbar
Total channels	2	4	4	5
Number of external connections	2	4	2	2
Sensor type (temperature)	Pt 100	TC type K / TC type T / TC type J	NTC	NTC
Measuring cycle	1 sec to 24 h (freely selectable, for online measurement 2 sec to 24 h)	1 sec to 24 h (freely selectable, for online measurement 2 sec to 24 h)	1 sec to 24 h (freely selectable, for online measurement 2 sec to 24 h)	1 sec to 24 h (freely selectable, for online measurement 2 sec to 24 h)
Transmission interval / communication cycle	-	-	-	-
Memory capacity	2 million measuring values	2 million measuring values	2 million measuring values	2 million measuring values
Interface	Mini USB, SD card slot	Mini USB, SD card slot	Mini USB, SD card slot	Mini USB, SD card slot
Operating/storage temperature	-35 to +70 °C -40 to +85 °C	-20 to +70 °C -40 to +85 °C	-20 to +70 °C -40 to +85 °C	-20 to +70 °C -40 to +85 °C
Battery type	1 x Lithium (TL-5903)	1 x Lithium (TL-5903)	1 x Lithium (TL-5903)	1 x Lithium (TL-5903)
Battery life	8 years (15 min measuring cycle, +25 °C)	8 years (15 min measuring cycle, +25 °C)	8 years (15 min measuring cycle, +25 °C)	8 years (15 min measuring cycle, +25 °C)
Dimensions / weight	103 x 63 x 33 mm approx. 220 g	103 x 63 x 33 mm approx. 230 g	103 x 63 x 33 mm approx. 220 g	103 x 63 x 33 mm approx. 230 g
Protection class	IP 65	IP 65	IP 65	IP 54
Software compatibility	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)
Order number	0572 1762	0572 1764	0572 1765	0572 1767

Extra-high-precision for monitoring during production: testo 176 series.

A comparison of testo 176 data loggers

testo 176 T1

testo 176 T3

testo 176 H2

General information

	testo 176 T1	testo 176 T3	testo 176 H2
Brief description	Data logger featuring robust metal housing without display, with internal Pt100 sensor for high-precision temperature monitoring in rooms, cold storage or freezer facilities.	Data logger featuring robust metal housing without display, with 4 connections for external TC probes for monitoring extreme temperatures such as cryogenic applications or when monitoring process temperatures	Data logger featuring robust metal housing without display and 2 connections for external temperature and humidity probes for monitoring the IAQ in buildings and for monitoring temperature and humidity in storage facilities

Technical data

Measurement parameter	Temperature	Temperature	Temperature/humidity
Measuring range	-35 to +70 °C	-100 to +750 °C (Type J) -195 to +1000 °C (Type K) -200 to +400 °C (Type T)	-20 to +70 °C / 0 to 100 %RH
Accuracy	±0.4 °C (-35 to +70 °C)*	±1% of m.v. (-200 to -100.1 °C)* ±0.3 °C (-100 to +70 °C)* ±0.5% of m.v. (+70.1 to +1000 °C)*	±0.2 °C (-20 to +70 °C)* ±0.4 °C* (remaining meas. range) / probe-specific
Solution	0.01 °C	0.1 °C	0.1 °C / 0.1 %RH
Total channels	1	4	4
Number of external connections	2	4	2
Sensor type (temperature)	Pt 100	TC type K / TC type T / TC type J	NTC
Measuring cycle	1 sec to 24 h (freely selectable, for online measurement 2 sec to 24 h)	1 sec to 24 h (freely selectable, for online measurement 2 sec to 24 h)	1 sec to 24 h (freely selectable, for online measurement 2 sec to 24 h)
Transmission interval / communication cycle	-	-	-
Memory capacity	2 million measuring values	2 million measuring values	2 million measuring values
Interface	Mini USB, SD card slot	Mini USB, SD card slot	Mini USB, SD card slot
Operating/storage temperature	-35 to +70 °C -40 to +85 °C	-35 to +70 °C -40 to +85 °C	-35 to +70 °C -40 to +8 5°C
Battery type	1 x Lithium (TL-5903)	1 x Lithium (TL-5903)	1 x Lithium (TL-5903)
Battery life	8 years (15 min measuring cycle, +25 °C)	8 years (15 min measuring cycle, +25 °C)	8 years (15 min measuring cycle, +25 °C)
Dimensions / weight	103 x 63 x 33 mm approx. 410 g	103 x 63 x 33 mm approx. 430 g	103 x 63 x 33 mm approx. 430 g
Protection class	IP 68	IP 65	IP 65
Software compatibility	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)	ComSoft BasicComSoft ProComSoft CFR (Validatable, audit trail; ERES)
Order number	0572 1761	0572 1763	0572 1766

Monitors and sounds the alarm: testo Saveris 2.

°C

%RH

mBar

CO_2

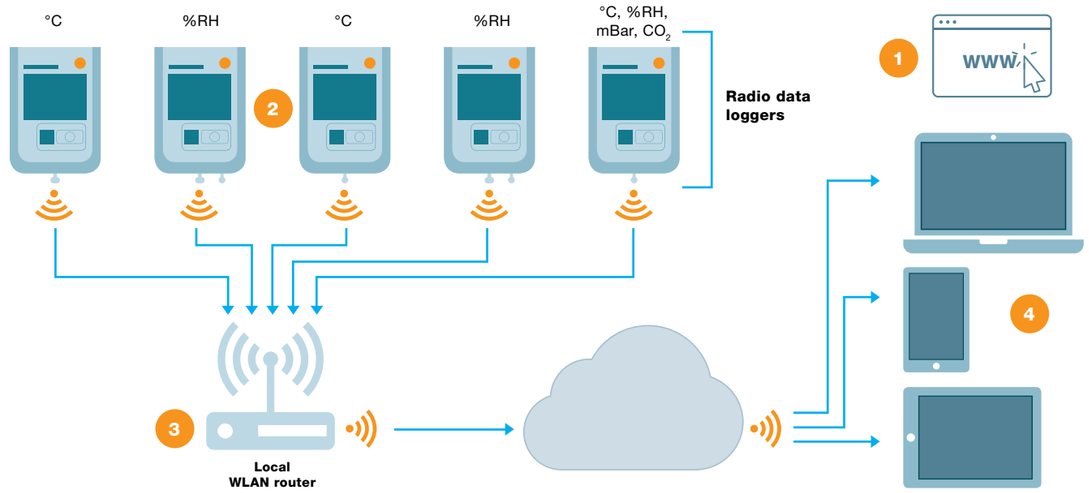
The testo Saveris 2 radio data logger system is the state-of-the-art solution for monitoring temperature and humidity values in storage and work areas. The system is simple to install, and can be implemented via your browser. The radio data loggers reliably record temperature and humidity values at adjustable intervals and transmit the readings via WLAN to the Testo Cloud.

The readings stored can be analyzed at any time, anywhere, using an internet-enabled smartphone, tablet or PC. Violations of limit values are immediately reported via e-mail, or optionally via SMS. This allows critical processes to be kept under control always, even if you are not on site. The long battery life additionally ensures that the testo Saveris 2 system needs to be serviced only rarely.

Suitable for monitoring the following areas and equipment:

- Indoor air quality
- Refrigerators and freezers
- Storage facilities
- Production

Overview of the system architecture.



IT know-how in a nutshell

1. The installation of the system works via internet and browser
2. The radio data loggers transmit the readings via WLAN to your local WLAN router
3. The router transmits the data to the Testo Cloud, where it is stored securely
4. You can now access your readings using any internet-capable terminal device

Monitors and sounds the alarm:
testo Saveris 2.

A comparison of testo Saveris 2 data loggers

testo Saveris 2 T1

testo Saveris 2 T2

testo Saveris 2 T3

testo Saveris 2 H1

testo Saveris 2 H2

testo 160 IAQ

General information

	testo Saveris 2 T1	testo Saveris 2 T2	testo Saveris 2 T3	testo Saveris 2 H1	testo Saveris 2 H2	testo 160 IAQ
Brief description	Radio data logger with display and internal NTC temperature sensor	Radio data logger with display and 2 connections for external NTC temperature probes	Radio data logger with display and 2 connections for external TC probes, for applications in extreme temperature ranges	Radio data logger with display, with internal sensors for measuring temperature and humidity	Radio data logger with display and connection for an external temperature and humidity probe	Radio data logger with display and integrated sensors for temperature, humidity, CO_2 and atmospheric pressure

Technical data

Measurement parameter	Temperature	Temperature	Temperature	Temperature/humidity	Temperature/humidity	Temperature, humidity, CO_2, atmospheric pressure
Measuring range	-30 to +50 °C	-50 to +150 °C	-195 to +1350 °C (Type K) -100 to +750 °C (Type J) -200 to +400 °C (Type T)	-30 to +50 °C / 0 to 100 %RH	dependent on probe	Temperature: -0 to +50 °C, humidity: 0 to 100 %RH (non-condensing), pressure: 600 to 1100 mbar, CO_2: 0 to 5000 ppm, ambient humidity: 0 to 99 %RH (non-condensing)
Accuracy	±0.5 °C	±0.3 °C	±(0.5 + 0.5 % of m.v.) °C	±0.5 °C / ±2 %RH	dependent on probe	Temperature: ±0.5 °C, humidity: ±2.0 %RH at +25 °C and 20 to 80 %RH ±3.0 %RH at +25 °C and < 20 and > 80 %RH ±1.0 %RH hysteresis ±1.0 %RH / year drift Pressure: ±3 mbar at +22 °C, CO_2: ±(50 ppm + 3 % of m.v.) at 25 °C Without external power supply: ±(100 ppm + 3 % of m.v.) at 25 °C
Solution	0.1 °C	0.1 °C	0.1 °C	0.1 °C / 0.1 %RH	0.1 °C / 0.1 %RH	Temperature: 0.1 °C, humidity: 0.1 %RH, pressure: 1 mbar, CO_2: 1 ppm
Total channels	1	2	2	2	2	4
Number of ext.connections	None	2	2	None	1	None
Sensor type (temperature)	NTC	NTC	TC type K / TC type T / TC type J	NTC	NTC	NTC
Measuring cycle	Dependent on the Cloud Basic licence: 15 min to 24 h Advanced: 1 min to 24 h	Dependent on the Cloud Basic licence: 15 min to 24 h Advanced: 1 min to 24 h	Dependent on the Cloud Basic licence: 15 min to 24 h Advanced: 1 min to 24 h	Dependent on the Cloud Basic licence: 15 min to 24 h Advanced: 1 min to 24 h	Dependent on the Cloud Basic licence: 15 min to 24 h Advanced: 1 min to 24 h	Dependent on the Cloud Basic licence: 15 min to 24 h Advanced: 1 min to 24 h / in battery mode 5 min to 24 h
Transmission interval / communication cycle	1 min to 24 h (15 min default)	1 min to 24 h (15 min default)	1 min to 24 h (15 min default)	1 min to 24 h (15 min default)	1 min to 24 h (15 min default)	Dependent on the Cloud Basic licence: 15 min to 24 h Advanced: 1 min to 24 h
Memory capacity	10,000 readings/channel	10,000 readings/channel	10,000 readings/channel	10,000 readings/channel	10,000 readings/channel	32,000 readings (sum of all channels)
Interface	WLAN; USB	WLAN; USB	WLAN; USB	WLAN; USB	WLAN; USB	WLAN; USB
Operating/storage tem.	-30 to +50 °C / -40 to +50 °C	-30 to +50 °C / -40 to +50 °C	-30 to +50 °C / -40 to +50 °C	-30 to +50 °C / -40 to +50 °C	-30 to +50 °C / -40 to +50 °C	0 to +50 °C
Battery type	4 x AA AlMn batteries; Mains unit optional; for temperatures below -10 °C please use Energizer batteries 0515 0572	4 x AA AlMn batteries; Mains unit optional; for temperatures below -10 °C please use Energizer batteries 0515 0572	4 x AA AlMn batteries; Mains unit optional; for temperatures below -10 °C please use Energizer batteries 0515 0572	4 x AA AlMn batteries; Mains unit optional; for temperatures below -10 °C please use Energizer batteries 0515 0572	4 x AA AlMn batteries; Mains unit optional; for temperatures below -10 °C please use Energizer batteries 0515 0572	4 x AA alkaline manganese batteries 1.5 V
Battery life	12 months	12 months	12 months	12 months	12 months	1 year
Dimensions / weight	95 x 75 x 30.5 mm / 240 g	96 x 75 x 30.5 mm / 240 g	97 x 75 x 30.5 mm / 240 g	115 x 82 x 31 mm / 240 g	95 x 75 x 30.5 mm / 240 g	117 x 82 x 32 mm / 269 g
Protection class	IP 65	IP 65	IP 54	IP 30	IP 54	IP 20
Software compatibility	www.saveris.net	www.saveris.net	www.saveris.net	www.saveris.net	www.saveris.net	www.saveris.net
Order number	0572 2031	0572 2032	0572 2033	0572 2034	0572 2035	0572 2014

Keep a watchful eye on all environmental parameters.

The reliable all-in-one solution: testo Saveris 1.

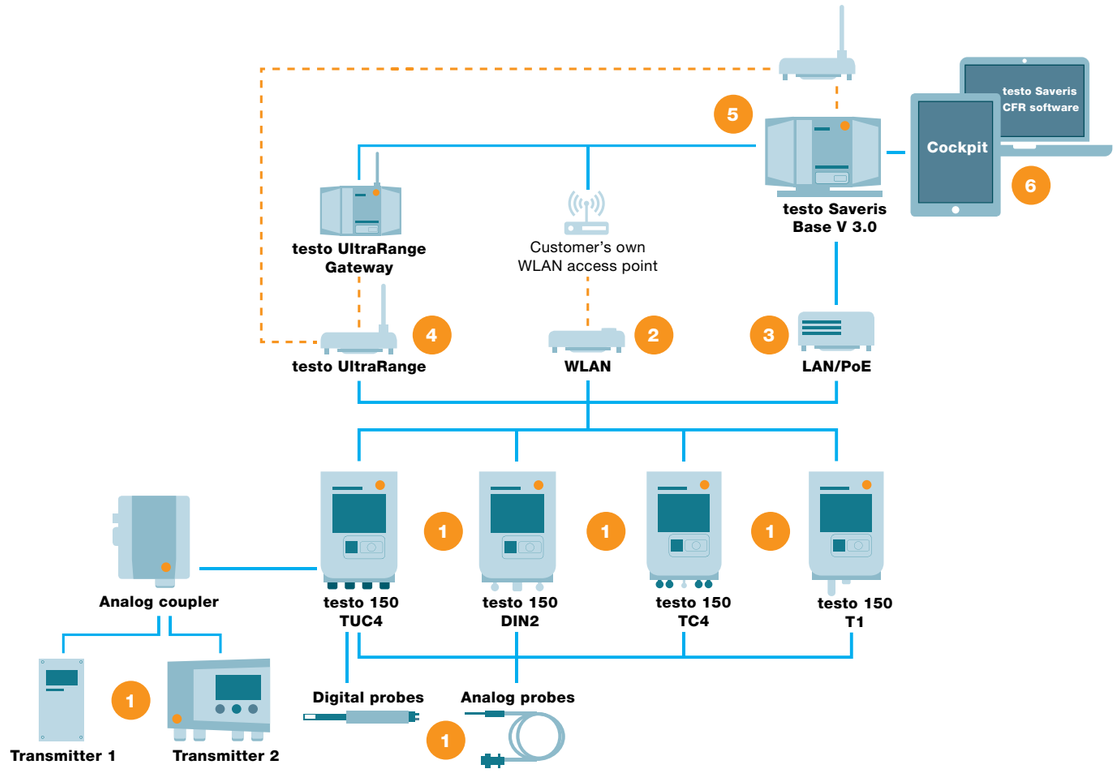
* Pressure and CO_2 can be measured via transmitters. (See diagram on the right).

Use the testo Saveris 1 environmental monitoring system to monitor the environmental parameters temperature and humidity as well as differential pressure* automatically and seamlessly (*by integrating testo's own transmitter). The system is so flexible that other required parameters can also be integrated via additional components. The modular design principle of the testo 150 data loggers allows perfect adaptation to the structural conditions of the place of use - so that various output interfaces can be flexibly combined with the different communication standards WLAN, LAN or testo Ultra Range.
The redundant data storage of the readings in the data logger, base station and software/database on a local server ensures maximum data security and uninterrupted documentation. The stored readings can be viewed and checked at any time and from any location via the browser-based cockpit. Real-time alerts via LED indications on the hardware as well as SMS or mail notifications via smartphone, tablet or desktop PC enable immediate intervention in the event of any limit value violations or system-relevant incidents.

Suitable for monitoring the following areas and equipment:

- (Research) laboratories
- Cleanrooms
- Greenhouses
- Biobanks, blood and tissue banks
- Refrigerators, freezers, ultra-low-temperature freezers, liquid nitrogen applications
- Warehouses and distribution centres

Overview of the system architecture.



IT know-how in a nutshell

The data logger modules, including any probes that may be needed as well as transmitters with analog couplers measure the required parameters (1).

The values are then transmitted either:
- by (2) WLAN (via the system's WLAN communication module and your local router)
- by (3) LAN (via the system's LAN/PoE module)
- or by (4) testo UltraRange radio (via testo UltraRange communication module and testo UltraRange Gateway)

- to the testo Saveris Base V3.0 (5).

You can then access your data via your computer using the testo Saveris PRO or CFR software or the web-based cockpit (6).

The reliable all-in-one solution:
testo Saveris 1.

testo Saveris 1 data loggers compared

testo 150 TUC4

EN 12830

testo 150 TC4

testo 150 DIN2

EN 12830

testo 150 T1

General information

	testo 150 TUC4	testo 150 TC4	testo 150 DIN2	testo 150 T1
Brief description	Data logger module with display and 4 connections for all Testo sensors with TUC (Testo Universal Connector)	Data logger module with display and 4 connections for external TC probes	Data logger module with display and 2 connections for external DIN probes	Data logger module with display and 1 internal NTC temperature sensor

Technical data

Measurement parameter	Temperature/humidity	Temperature	Temperature	Temperature
Measuring range	Analog (NTC): -40 to +150 °C Digital: See probes	1. TC Type K: -200 to +1350 °C 2. TC Type J: -100 to +750 °C 3. TC type T: -200 to +400 °C	NTC: -40 to +150 °C Pt100: -200 to +600 °C	-40 to +50 °C (internal probe)
Accuracy	Analog (NTC): ±0.3 °C Digital: See probes	±(0.5 °C + 0.5% of measured value)	NTC: ±0.3 °C Pt100: ±0.1 °C (0 to +60 °C) ±0.2 °C (-100 to +200 °C) ±0.5 °C (other measuring ranges)	±0.4 °C
Solution	Analog (NTC): 0.1 °C / 0.1 °F Digital: See probes	0.1 °C	NTC: 0.1 °C / 0.1 °F Pt100: 0.01 °C / 0.01 °F	0.1 °C / 0.1 °F
Total channels	16	4	2	1
Number of external connections	4	4	2	0
Sensor type (temperature)	Pt100 / NTC	TC type K / TC type T / TC type J	Pt100 / NTC	NTC
Measuring cycle	5 seconds to 24 hours (Ethernet communication) / 1 minute to 24 hours (testo UltraRange radio or WLAN)	5 seconds to 24 hours (Ethernet communication) / 1 minute to 24 hours (testo UltraRange radio or WLAN)	5 seconds to 24 hours (Ethernet communication) / 1 minute to 24 hours (testo UltraRange radio or WLAN)	5 seconds to 24 hours (Ethernet communication) / 1 minute to 24 hours (testo UltraRange radio or WLAN)
Transmission interval / communication cycle	1 min to 24 h	1 min to 24 h	1 min to 24 h	1 min to 24 h
Memory capacity	min. 16,000 readings per channel	min. 64,000 readings per channel	min. 128,000 readings per channel	256,000 readings per channel
Interface*	Ethernet/Wlan/UltraRange	Ethernet/Wlan/UltraRange	Ethernet/Wlan/UltraRange	Ethernet/Wlan/UltraRange
Operating/storage temp.	-40 to +50 °C / -40 to +60 °C	-40 to +50 °C / -40 to +60 °C	-40 to +50 °C / -40 to +60 °C	-40 to +50 °C / -40 to +60 °C
Battery type	4 x AA batteries. At temperatures below +10 °C, the use of Energizer Li batteries is recommended (0515 0572)	4 x AA batteries. At temperatures below +10 °C, the use of Energizer Li batteries is recommended (0515 0572)	4 x AA batteries. At temperatures below +10 °C, the use of Energizer Li batteries is recommended (0515 0572)	4 x AA batteries. At temperatures below +10 °C, the use of Energizer Li batteries is recommended (0515 0572)
Battery life	testo UltraRange: up to 7.2 years WLAN: 3.5 years (1 h communication cycle, 15 min measurement, +25 °C, 1 digital NTC probe connected)	testo UltraRange: up to 6.4 years WLAN: 3.3 years (1 h communication cycle, 15 min measurement, +25 °C, 1 type K probe connected)	testo UltraRange: up to 6.7 years WLAN: 3.7 years (1 h communication cycle, 15 min measurement, +25 °C, 1 analog NTC probe connected)	testo UltraRange: up to 7.2 years WLAN: 3.5 years (1 h communication cycle, 15 min measurement, +25 °C)
Dimensions / weight	69.3 x 88.0 x 29.0 mm / approx. 255 g	69.3 x 89.3 x 29.0 mm / approx. 255 g	69.3 x 87.9 x 29.0 mm / approx. 255 g	69.3 x 88.3 x 29.0 mm / approx. 255 g
Protection class	IP 67 & IP 65 (with mounted testo UltraRange and WLAN communication module), IP 30 (Ethernet) (in each case without probe)	IP 67 & IP 65 (with mounted testo UltraRange and WLAN communication module), IP 30 (Ethernet) (in each case without probe)	IP 67 & IP 65 (with mounted testo UltraRange and WLAN communication module), IP 30 (Ethernet) (in each case without probe)	IP 67 & IP 65 (with mounted testo UltraRange and WLAN communication module), IP 30 (Ethernet) (in each case without probe)
Software compatibility	testo Saveris PRO software, testo Saveris CFR software (validatable; ERES & audit trail)	testo Saveris PRO software, testo Saveris CFR software (validatable; ERES & audit trail)	testo Saveris PRO software, testo Saveris CFR software (validatable; ERES & audit trail)	testo Saveris PRO software, testo Saveris CFR software (validatable; ERES & audit trail)
Order number	**0572 3320**	**0572 3330**	**0572 3340**	**0572 3350**

* Communication module must be ordered separately

The reliable all-in-one solution:
testo Saveris 1.

	Digital analog coupler
General information	
Brief description	Digital analog coupler with current/voltage input for integrating other measurement parameters
Technical data	
Measuring range	4 to 20 mA; 0 to 10 V
Accuracy	Power Maximum error: ±0.03 mA Resolution (min. error): 0.75 µA (16 bit) Typical error: 5 µA Voltage 0 to 1 V maximum error: ±1.5 mV Resolution (min. error): 39 µV (16 bit) Typical error: 250 µV 0 to 5 V maximum error: ±7.5 mV Resolution (min. error): 0.17 mV Typical error: 1.25 mV 0 to 10 V Maximum error: ±15 mV Resolution (min. error): 0.34 mV Typical error: 2.50 mV
Connections	2- or 4-wire Current/voltage input
Measuring cycle	1 min to 24 h
Transmission interval / communication cycle	depends on method of communication of testo 150
Memory capacity	6,000 readings
Operating/storage temperature	Operating temperature: +5 to +45 °C Storage temperature: -25 to +60 °C
Power supply	Power supply via testo 150 TUC4 logger
Dimensions / weight	85 x 100 x 38 mm / 240 g
Protection class	IP54
Order number	**0572 2166**

	LAN communication module	WLAN communication module	testo UltraRange communication modules
General information			
Brief description	LAN communication module with PoE for testo 150 data loggers	WLAN communication module for testo 150 data logger	testo UltraRange communication modules for testo 150 data logger and testo UltraRange Gateway or testo Base V3.0
Technical data			
Transmission interval / communication cycle	1 min to 24 h	1 min to 24 h	1 min to 24 h
Radio frequency	-	2.4 GHz	868 MHz (Europe region) 868 MHz (China) 920 MHz (APAC* region) 915 MHz (Americas region) 922 MHz (South Korea) 865 MHz (India) 868 MHz (Russia)
Transmission range	-	20 m inside buildings	100 m inside buildings (depending on spatial conditions) 17 km with no obstructions
Operating/storage temperature	-35 to +50 °C / -40 to +60 °C	-35 to +50 °C / -40 to +60 °C	-35 to +50 °C / -40 to +60 °C
Dimensions / weight	67.8 x 29.5 x 28.9 mm / Approx. 45 g	67.8 x 12.2 x 28.9 mm / Approx. 17 g	67.8 x 112.8 x 28.9 mm / Approx. 30 g
Protection class	IP 30 (when connected to a testo 150 data logger module)	IP 67 (when connected to a testo 150 data logger module)	IP 67 (when connected to a testo 150 data logger module)
Compatible with	testo 150 TUC4, testo 150 TC4, testo 150 DIN2, testo 150 T1	testo 150 TUC4, testo 150 TC4, testo 150 DIN2, testo 150 T1	testo 150 TUC4, testo 150 TC4, testo 150 DIN2, testo 150 T1
Order number	**0554 9330**	**0554 9320**	***see overview**

Version	for	Order no.
Region Europe	Data logger	0554 9311 01
	Base and Gateway	0554 9311 02
Region Americas	Data logger	0554 9312 01
	Base and Gateway	0554 9312 02
Region China	Data logger	0554 9313 01
	Base and Gateway	0554 9313 02
Region APAC*	Data logger	0554 9314 01
	Base and Gateway	0554 9314 02
Region South Korea	Data logger	0554 9315 01
	Base and Gateway	0554 9315 02
Region India	Data logger	0554 9316 01
	Base and Gateway	0554 9316 02
Region Russia	Data logger	0554 9317 01
	Base and Gateway	0554 9317 02

*Japan, Malaysia, Singapore, Taiwan, Macau

Keep a watchful eye on all environmental parameters.

The reliable all-in-one solution:
testo Saveris 1.

	testo Saveris Base V3.0	testo UltraRange Gateway
		
General information		
Brief description	Base station for managing up to 3,000 measurement channels	Transmission support for using the testo UltraRange radio technology
Technical data		
Connections	2x USB LAN/PoE: Transmission rate 10/100 Mbit PoE class 0 micro USB alarm relay connection	1x USB LAN/PoE: Transmission rate 10/100 Mbit PoE class 0 micro USB
Channels per Base	3000	-
Loggers per Gateway	-	40
Max. number of measurement values	1,200,000.00 (circular buffer memory)	-
Operating/storage temperature	+5 to +35 °C / -20 to +60 °C	0 to +45 °C / -20 to +80 °C
Power supply	PoE class 0; optionally via mains unit & micro USB cable (order no. 0572 5004)	PoE class 0; optionally via mains unit & micro USB cable (order no. 0572 5004)
Rechargeable battery type	Li-Ion rechargeable battery, 3.7 V / 2.6 Ah, order no. 0515 0107 (for data backup and emergency alarm in the event of power failure)	
Dimensions / weight	193 x 112 x 46 mm / approx. 370 g	193 x 112 x 46 mm / approx. 314 g
Protection class	IP 20	IP 20
Order number	0572 9320	0572 9310

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